



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**In re Application of:
Sisson et al.**

For: Article Comprising Light Absorbent
Composition to Mask Visual Haze and Related
Methods

Serial No. 10/769,167

Filed: 1/30/2004

DECLARATION UNDER 37 C.F.R. §1.131

Dear Sir:

We, Arianna Giovannini, Simone Ferrero, and Edwin A. Sisson, hereby declare that:

(1) We are the Applicant in the subject patent application (United States Patent Application Serial No. 10/769,167) and are coinventors of the invention disclosed and claimed therein.

(2) One of the articles taught in United States Patent Application Serial No. 10/769,167 is a bottle having a thermoplastic matrix with domains of an incompatible filler between 400-700nm and a colorant which absorbs sufficient light at the wavelengths corresponding to the size of the domains so that the visual haze of the bottle is decreased. Attached Exhibits A and B describe experiments done in Italy demonstrating a reduction to practice of the claimed invention.

(3) Exhibit A describes Cobig 075, Cobig 087 and Cobig 088 and their observed transparency. The Cobig composition is shown in Exhibit B, line 2. Cobig is the designation used to describe Aqua (which is the polyester bottle resin) plus 0.04% PMDA upgraded to 0.8dl/g mixed with 5% MXD6 Nylon. In this series of experiments, colored and non-colored

bottles were produced. The Cobig 088 coloured green showed improved transparency over the non-coloured bottles (Exhibit A page 1, line 4 and page 3, lines 2 to 3).

(4) The Cobig 088 bottle formulation is the formulation referenced in the specification at page 27, line 26 to page 28, line 21.

(5) Exhibit C is a detailed report of the Cobig 088 domains in the clear and green formulations. The Cobig 088 preforms in Exhibit C are the same green preforms used to make the bottles of Exhibit A which were reported to have the best transparency (least visible haze). The average domain size for the clear Cobig 088 formulation blown into a bottle was 529nm (page 20 of Exhibit C) which corresponds to the green spectra (page 21 of Exhibit C) and it was the green colour which masked the haze of the bottle of Exhibit A.

(6) All of the dates which have been redacted from Exhibit A, B, and C are before October 17, 2003.

(7) The invention now being claimed in the subject patent application was conceived and reduced to practice before October 17, 2003. We know this to be true of our own personal knowledge as evidenced by the facts heretofore stated in this Declaration and as shown in Exhibits A, B, and C.

(8) The inventions claimed in Takeda et al. (Pub. No. 2005/0238885)¹ and Weaver et al (U.S. Patent No. 6,787,589) are different from the invention being claimed in the subject patent application because the claims of Takeda et al. (Pub. No. 2005/0238885) calls for a visible light absorbing film formed by a visible light absorbing ink having been coated on one side or both sides of a substrate which has solar radiation reflecting properties and whose visible light reflectance is 10% or more, characterized in that the degree of

¹ The office action incorrectly referenced Takeda as Pub. No. 2002/0001684. The proper reference was clarified by a phone conversation from Edwin Sisson to Examiner Dooner on December 12, 2005.

reduction of visible light reflectance is 0.9 or less as defined by degree of reduction of visible light reflectance = [visible light reflectance (%) after coating of the ink]/[visible light reflectance (%) before coating of the ink] and the degree of reduction of solar radiation reflectance is 0.25 or more as defined by degree of reduction of solar radiation reflectance = [solar reflectance (%) after coating of the ink]/[solar radiation reflectance (%) before coating of the ink]. This is in contrast to the invention now being claimed in the subject patent application wherein thermoplastic matrix contains incompatible fillers whose domains correspond to the wavelength of the colorant mixed into the thermoplastic or in layer covering the matrix. Weaver et al (U.S. Patent No. 6,787,589) claims an amber polyester and mentions nothing about domains existing in the polyester. Neither Takeda et al or Weaver et al disclose incompatible domains size correspond to wavelength of the light absorbed by the colorant. Accordingly, the invention being claimed in the subject patent application is different from the invention being claimed in Takeda et al or Weaver et al (U.S. Patent No. 6,787,589).

(9) We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the subject United States Patent Application Serial No. 10/769,167 or any patent issuing thereon.

Our signatures follow on next page.

Further declarants sayeth not.

Arianna Giovanni

Arianna Giovanni

16/02/06

Date

James Bozzini

Witness

Simone Ferrero

Simone Ferrero

16/02/06

Date

James Bozzini

Witness

Edwin A. Sisson

Edwin A. Sisson

20/02/06

Date

James Bozzini

EXHIBIT A OF DECLARATION



SINCO

TECHNICAL REPORT

Rivalta Scrivia (AI), Italy

Test: DSC analysis on preforms and bottles made by Cobig resins.

The aim of this work was to evaluate the influence of crystallinity on the transparency of the bottles made by Cobig resins. The bottles made by resins named Cobig 075, Cobig 087 e Cobig 088 show a good transparency, moreover the addition of a green pigment in different concentration on the Cobig 088 resin shows better transparency behavior. The calorimetric analysis on the preforms and bottles were made with the purpose to show the possible correlation between transparency and crystallinity of the polymers.

The instrument used for this action is a Mettler Toledo, model DSC 30. The used method for preforms applied a heating ramp of 10°C/min from 30 to 300°C (*1st run*), a cooling ramp of 100°C/min from 300°C to 30°C then a isotherm at 30°C for 1 minute and a new heating ramp of 10°C/min from 30°C to 300°C (*2nd run*), the method was under nitrogen atmosphere. The obtained value are reported in the table 1.

Table 1. Preforms DSC data

COBIG (c: clear, g: green)		075 c	087 c	088 c	088 0,045% g	088 0,09% g	088 0,36% g
1 st Run	TG	Onset (°C)	65,33	68,42	72,73	69,22	71,17
		Mid p. (°C)	71,16	73,94	75,95	73,86	77,63
	Crist.	Onset (°C)	122,77	122,43	125,82	123,99	123,95
		Peak (°C)	133,86	132,41	135,59	133,91	134,01
		Int. N. (J/g)	24,57	23,79	24,19	23,18	23,91
	Melt.	Onset (°C)	223,18	224,34	222,65	230,35	228,25
		Peak (°C)	242,93	244,5	242,74	243,12	242,86
		Int. N. (J/g)	36,05	37,84	37,40	37,17	39,55
2 nd Run	TG	Onset (°C)	77,20	76,77	76,41	76,60	75,75
		Mid p. (°C)	79,43	79,80	79,21	79,18	79,33
	Crist.	Onset (°C)	126,78	128,68	129,66	129,92	130,05
		Peak (°C)	137,84	138,14	138,30	138,65	138,76
		Int. N. (J/g)	22,19	26,09	26,15	26,45	26,64
	Melt.	Onset (°C)	221,47	221,44	219,24	220,45	219,40
		Peak (°C)	241,93	242,52	241,90	242,50	241,75
		Int. N. (J/g)	37,07	37,84	38,17	37,46	40,22
							39,03

The bottles were analyzed cutting a body fragment, the DSC method was programmed with a heating ramp of 100°C/min from 30°C to 300°C then an isotherm at 300°C for three minutes and a cooling ramp of 10°C/min from 300°C to 30°C, the method was under nitrogen atmosphere. To compare the obtained data with commercial resins used for bottles production, the analysis were conducted on some samples of trade bottles. The obtained data are reported in the table 2.

Table 2. Bottles DSC data

EXHIBIT A OF DECLARATION



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TECHNICAL REPORT

Rivalta Scrivia (AL), [REDACTED] Italy

Resin	Bottle volume (l)	Onset (°C)	Peak (°C)	Int. Norm. (J/g)
Cobig 075 clear	1,5	198,56	191,03	35,64
Cobig 087 clear	1,5	192,23	183,32	30,08
Cobig 088 clear	0,5	194,64	184,49	31,95
Cobig 088 + 0,036% green	0,5	194,47	184,90	33,98
Cobig 088 + 0,09% green	0,5	193,25	183,76	33,01
Cobig 088 + 0,36% green	0,5	194,82	184,44	35,93
PET "Alte Vette"	1,5	186,48	172,03	39,41
PET "Ferrarelle"	0,5	190,33	178,51	33,16

Conclusions

The results obtained, in particular on the bottles, show a different behavior between Cobig resins and commercial PET examined. The resin Cobig 075 from an optical evaluation give a bottle with a better characteristic, nevertheless this resin shows the worst thermal behavior from the resins under examination. In fig. 1 is possible to see the comparison between Cobig resins and commercial PET thermogram.

Fig. 1 Thermograms of Cobig resins and commercial PET.

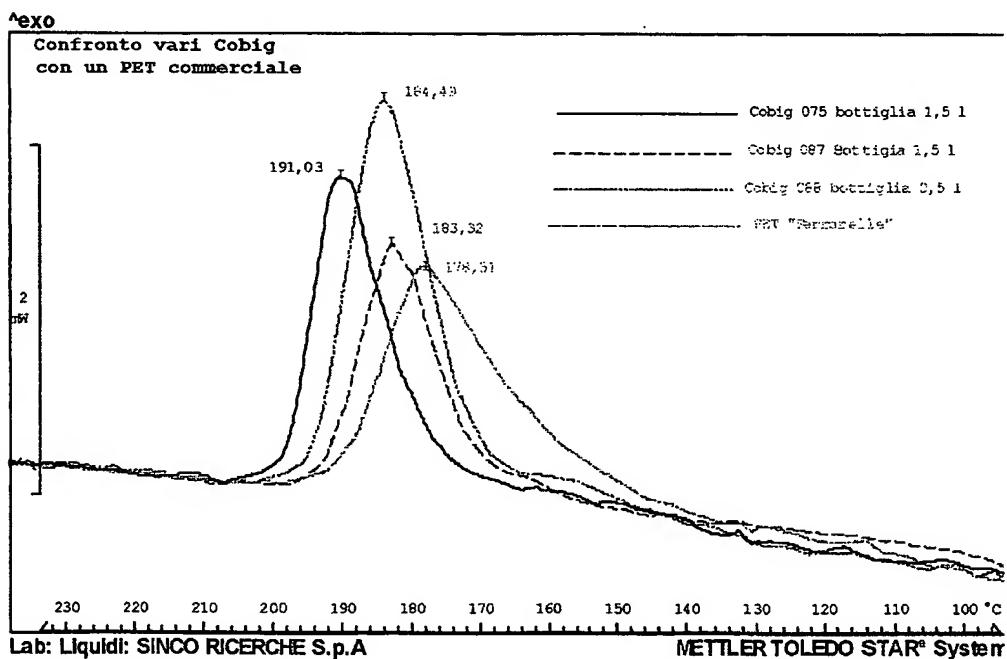


EXHIBIT A OF DECLARATION



SINCO

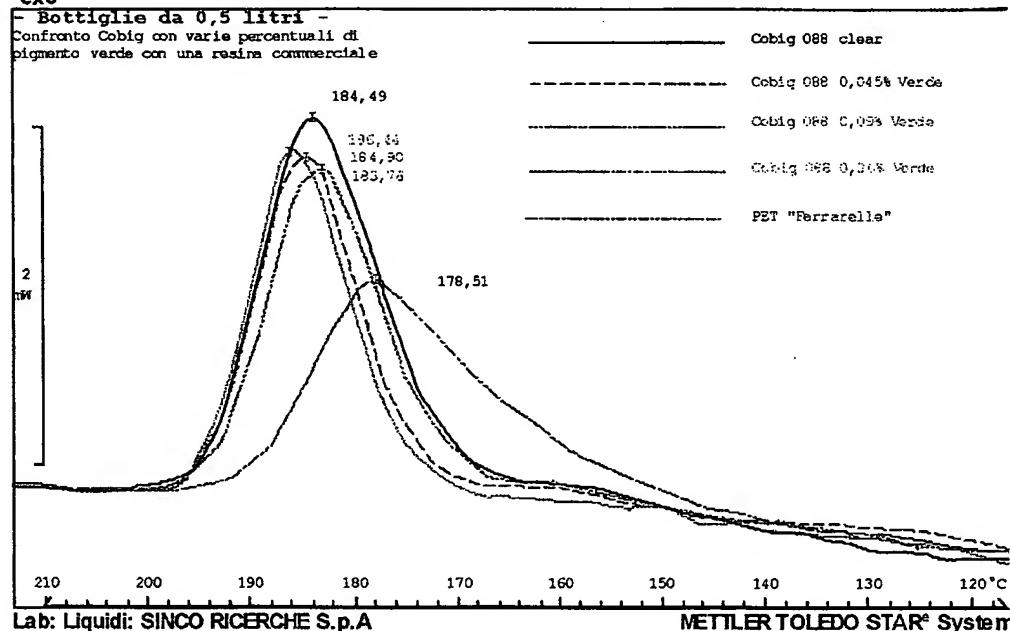
TECHNICAL REPORT

Rivalta Scrivia (AI), [REDACTED] Italy

The same consideration can be done analysing the results obtained from the pigmented bottles thermograms. In fact the resin Cobig 088 give the better visual results with maximum pigment addition (0,36%), but on the same time the thermal behavior is the worst. In fig.2 is possible to see the thermograms comparison between different amount of green pigment on the Cobig 088 resins.

Fig.2 Thermograms of Cobig 088 with different amount of green pigment.

^{exo}



From obtained value we can suppose that the better transparency didn't depend only by the crystallinity effect, in fact, the comparison of commercial PET bottles, and Cobig bottles have a less crystallinity degree. The residual haze of the bottles obtained by the Cobig resins is probably done by other reasons different from an excess of crystallinity in the blend PET/MXD.

Pigment amount of 0,09% give the better thermal results while different pigment amount seem to worse the thermal behavior. In this case the difference between the obtained value is minimum, probably due at experimental error.

EXHIBIT B OF DECLARATION



SINCO

TECHNICAL REPORT

CONFIDENTIAL

Tortona, [REDACTED] Italy

Project Cobig

Influence of preform colouring on mechanical performance on Cobig bottles

Author: M. Iafrate

Aim of this work to evaluate the influence of colour on bottles mechanical performance; for this scope bottles, from resin Cobig-087 (Aqua +0.04% PMDA up. 0.8dl/g+ 5% MXD Ca/Mg), were product clear and coloured with green Italy Green-1, usually used by Ferrarelle. All comparisons described in the report between both samples are obtained from bottles produced according to the same temperature profile of injection process, that was 280°C.

Mechanical Properties evaluation

Analyses of burst, top load, creep and stress cracking were carried out on bottles produced during the above tests.

The bottles were tested after a conditioning, at room ambient (20°C +/- 1), of minimum 24hrs. The all obtained data, are reported in the following table:

	TOP LOAD (kg)		BURST (bar)		CREEP (%)		Stess Cracking
	Value	dev. st.	Value	dev. st.	Value	dev. st.	
COBIG-087 Clear	14,3	0,2	9,7	0,7	7,0	0,7	excellently
COBIG-087-Green	13	0,3	9,0	0,0	8,7	0,2	excellently

The bottles, produced using the colour Italy Green-1, show a *slight lower top load and burst performance* than the clear bottles; relevant is *the creep* difference, instead, the volume variation recorded for the coloured bottles is *higher than the clear bottles*, the events could be explained like a lubricating effect due to the pigment colour presence.